DOCUMENT RESUME

ED 344 583 IR 015 538

TITLE	Curriculum Guidelines for Accreditation of Educational Computing and Technology Programs. A Folio Preparation Manual.
INSTITUTION	International Society for Technology in Education, Eugene, OR.
PUB DATE	Jan 92
NOTE	61p.
AVAILABLE FROM	International Society for Technology in Education, 1787 Agate Street, Eugene, OR 97403-1923.
PUB TYPE	Guides - Non-Classroom Use (055)
EDRS PRICE	MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	*Accreditation (Institutions); Accrediting Agencies; Behavioral Objectives; *Computer Literacy; Curriculum Development; Educational Technology; Elementary Secondary Education; Guidelines; Higher Education; *Information Technology; Program Development; Program Evaluation; *Teacher Education Programs; *Technological Literacy
IDENTIFIERS	*National Council for Accreditation of Teacher Educ

ABSTRACT

The purpose of this report is to provide guidance to teacher education institutions that are developing programs in educational computing and technology to assist them in preparing folios for the National Council for Accreditation of Teacher Education (NCATE) program evaluation. Those institutions with teacher preparation programs resulting in computer and technology literacy endorsement or a master's degree in educational computing and technology leadership that seek NCATE accreditation will, as a precondition to unit accreditation, submit folios to the International Society for Technology in Education (ISTE). This report provides information on the preparation of folios, the process by which folios are evaluated, and instruction, examples, definitions, and explanations that will assist in folio preparation. Guidelines for the Computer and Technology Literacy program and the Educational Computing and Technology Literacy program are also included. Performance objectives are provided in the program descriptions. (44 references) (DB)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy

ED344583

IR 015 538

BEST COPY AVAILABLE

"PERMISSION TO REPRODUCE THIS MATERIAL IN **OTHER THAN PAPER COPY** HAS BEEN GRANTED BY

D. Moursund

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

International Society
for Technology in Education

Curriculum Guidelines for Accreditation of Educational Computing and Technology Programs

Developed by
The ISTE Accreditation Committee

Lajeane Thomas, Chair
Louisiana Tech University
Ruston, Louisiana

Don Knezek
Educational Service Center - Region 20
San Antonio, Texas

Harriet Taylor
Louisiana State University
Baton Rouge, Louisiana

Joyce Friske
Jenks Public Schools
Jenks, Oklahoma

Sally Sloan
Winona State University
Winona, Minnesota

James Wiebe
California State University
Los Angeles, California

January, 1992

ACKNOWLEDGEMENTS

A special thank you to the ISTE membership and to those many other dedicated professionals who shared their expertise with the Accreditation Committee through responses to the numerous surveys associated with development of the current standards and guidelines. Your responses were invaluable in the development and refinement of the standards.

Thanks also to the ISTE Board and staff. The support of these individuals was extraordinary. From sharing of professional expertise to providing financial support for Accrediation Committee activities, the ISTE Board and staff have been contributed immeasurably to the success of the accreditation initiatives.

ISTE Board of Directors 1991-2

Bonnie Marks, President
David Moursund, Executive Officer
C. Dianne Martin, Associate Executive Officer

Executive Board Members

Sally Sloan, President-Elect
Gary Bitter, Past-President
Barry Pitsch, Secretary/Treasurer
Don Knezek, Policy, Leadership, and Coordination Representative
Jenelle Leonard, Policy, Leadership, and Coordination Representative

Board Members

Ruthie Blankenbaker, K-12 Representative
Sheila Cory, Special Interest Group Representative
Cyndy Everest-Bouch, K-12 Representative
Susan Friel, University Representative
Margaret Kelly, Representative At-Large
Marco Murray-Lasso, International Representative
Paul O'Driscoll, Information Resource Manager
David Walker, Representative At-Large

ISTE Staff

Anita Best, ISTE Staff Editor

The utmost thanks to the families of the Accreditation Committee members. The work of the Accreditation Committee often took place on weekends and vacation times that would otherwise have been spent with families. Without the support of the families, this committee's work could not have been accomplished.

TABLE OF CONTENTS

Introduction	1
The Challenge	1
The Possibilities	1
Quality Preparation	2
Purpose of this Document	2
Historical Development	3
Theoretical Basis for Levels of Preparation	4
Levels of Preparation in Educational Computing and Technology	6
Foundations	6
Fundamental Skills for all Teachers	6
ISTE Foundations Standards	7
Implications	8
Computer/Technology Literacy	8
Educational Computing and Technology Leadership	9
Future Directions	10
Computer Science Education	
Unit Accreditation Recommendations	
Folio Review Process	11
Basic and Advanced Programs in Educational Computing and Technology	14
Cover Sheet	16
Instructions	18
Computer/Technology Literacy Matrix	20
Educational Computing and Technology Leadership Matrix	27
Special Instructions for Preparing Folios	34
Glossary	49
Resources	52
Accreditation Team	55

CURRICULUM GUIDELINES FOR ACCREDITATION OF EDUCATIONAL COMPUTING AND TECHNOLOGY PROGRAMS

I. INTRODUCTION

THE CHALLENGE

The challenge facing not only American schools, but schools all over the world, is the empowerment of our children to function effectively in their future. This future is marked increasingly by change, the growing importance of information and information access, and evolving technologies. This future is also marked by an increasing disparity between those who have the information technology skills to cope in a modern society and those who are deprived of the opportunities to acquire those skills. To avoid even greater inequities in this information age, there is a need for schools to equip students to become effective in solving problems and managing information of relevance to themselves and to society.

THE POSSIBILITIES

To meet this challenge, the restructuring of learning environments can be a key element. Research supports the need to redirect the role of teachers to be facilitators of learning. The restructured curriculum must include an increased focus on skills for accessing information and on developing judgment and wisdom in using information to solve problems. With increased access to information and information technology, students' energies can be focused on higher order tasks rather than mere mechanics. Exciting innovations in technology provide tools for locating, manipulating, and sharing information. But introduction of new tools for learning into the educational process requires not only fiscal resources, but training in the appropriate use of technology in educational settings.

If technology is to become an integral component of the educational process of our schools, it must first become an essential part of America's teacher preparation programs. ISTE recognizes the powerful

impact information technology, appropriately applied, can have on education. Teacher education institutions have begun establishing policies requiring computer/technology competencies of their graduates and preparing teachers and leaders in the area of educational computing and technology.

QUALITY PREPARATION

To promote quality preparation in the use of technologies in education, the International Society for Technology in Education (ISTE) has established guidelines for evaluating university computer/technology education programs in the United States of America. These competency-based standards have been approved by the National Council for Accreditation of Teacher Education (NCATE) as the standards by which computer/technology education programs for teachers are evaluated. This document describes guidelines for programs leading to teaching endorsements in computer/technology literacy and the master's degree in educational computing and technology leadership. In addition to these two specific levels of preparation, ISTE has established guidelines in general technology training for all teacher preparation programs.

PURPOSE OF THE DOCUMENT

The purpose of this document is to provide guidance to teacher preparation institutions that are developing programs in educational computing and technology and to assist them in preparing folios for the National Council for Accreditation of Teacher Education (NCATE) program evaluation. Those institutions with teacher preparation programs resulting in computer/technology literacy endorsement or a master's degree in educational computing and technology leadership that seek NCATE accreditation will, as a precondition to unit accreditation, submit folios to the International Society for Technology in Education (ISTE). This document provides information regarding the preparation of folios, the process by which the folios are evaluated, and instructions, examples, definitions, and explanations that will assist in folio preparation.

II. HISTORICAL DEVELOPMENT

In 1989, the ISTE Accreditation Committee was formed to develop accreditation standards related to computer knowledge and skills. The committee used a variety of sources to develop a comprehensive list of skills and knowledges that might be required for students pursuing programs involving computer-related technology. The following time line lists the major events in the development of the guidelines within this document.

02/89	ISTE established Accreditation Committee
10/89-01/90	Survey to identify the role of technology in restructured schools and competencies needed for all teachers, principals, computer coordinators, and administrators
01/90	ISTE granted constituent professional membership in NCATE.
1-6/90	Review of literature to collect technology competencies
04/90	Audio Forum to collect samples of technology use in restructured schools
2-6/90	Survey of Technology Competencies-workshop and mailout
1-3/91	Development of computer/technology literacy and educational computing and technology guidelines survey based on technology competency survey
4-5/91	Revision of guidelines based on survey results
5-7/91	Final guidelines surveys to ISTE members, other professional organizations, Chief State School Officers, Deans of Colleges of Education
07/91	Refinements made based on results
09/91	Presentation of computer/technology literacy and educational computing and technology leadership guidelines to NCATE
09/91	Guidelines approved by NCATE

Through input from hundreds of educators, the standards were developed and refined. These standards and guidelines have been considered and adopted by ISTE and NCATE.

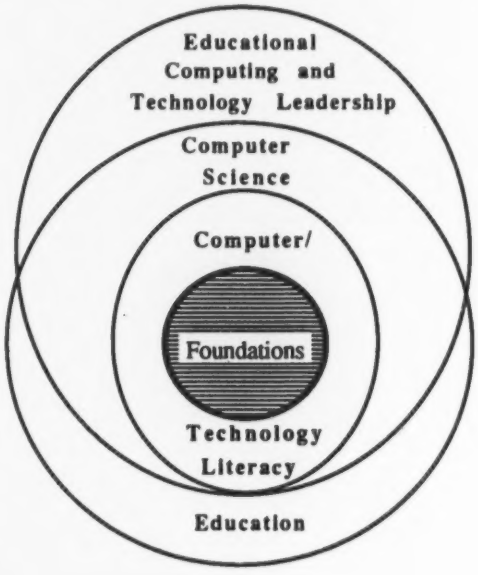
III. THEORETICAL BASIS FOR LEVELS OF PREPARATION

The primary mission of ISTE is to improve education through the appropriate use of technology. Computer related technology can make substantial contributions to improving both the content of the curriculum and the instructional delivery system. ISTE believes that computer-related technology must become a tool that students and teachers use routinely if students are to be adequately prepared for adult citizenship in our Information Age society. Therefore, this document includes not only standards for the two NCATE approved programs that prepare teachers in the educational computing and technology content area, but also emphasizes the foundations in computer-related technology that all teachers should have regardless of area of certification.

This document includes the guidelines for the two program areas which have been approved by NCATE:

1. Computer/Technology Literacy, and
2. Educational Computing and Technology Leadership.

The following figure illustrates the relationships among these two levels of preparation and the foundations requirements that all teachers should receive, as well as the Computer Science Education program guidelines which are under development at this time.



Levels of Preparation in Educational Computing and Technology

Notice that the foundations requirements are at the center of each program, indicating that these skills are basic to any level of preparation. ISTE suggests that foundations skills be included in all teacher education programs regardless of area of specialization. Of course, ISTE cannot impose these foundations on every teacher preparation program, but nevertheless feels compelled to designate these as essential for all teachers as a point of information for those who are developing new programs or upgrading their curriculum to include modern educational practices. Therefore, in developing the ISTE recommendations for basic and advanced programs, foundations guidelines are prerequisite to all programs in educational computing and technology.

Also, the computer science education program, currently in development is included in the diagram. This program encompasses all skills included in the foundations guidelines as well as those in the computer/technology literacy matrix. This indicates that a teacher of computer science at the secondary level should also have the skills needed to use technology in instruction (foundations) and to teach computer/technology literacy skills.

The Educational Computing and Technology Leadership program is a master's level program. It encompasses the foundations and the computer/technology literacy skills, but does not totally encompass the competencies developed in the computer science education program. The Educational Computing and Technology Leadership program focuses not on computer science, but on application of computing and related technologies in educational settings. It also emphasizes the curriculum development and leadership skills needed to serve as a computer/technology coordinator for a school, district, or region.

IV. LEVELS OF PREPARATION IN EDUCATIONAL COMPUTING AND TECHNOLOGY

FOUNDATIONS
Fundamental Skills For All Teachers

The guidelines include a subset of skills that build a foundation for applying computers and related technologies in educational settings. These skills are fundamental for all teachers, not just those who teach information technology courses. The International Society for Technology in Education (ISTE) recognizes that information technology education is an essential part of teacher preparation. Professional studies in educational computing/technology provide fundamental concepts and skills that build a foundation for applying computers and related technologies in educational settings. All teacher preparation programs should provide foundations in information technology. ISTE has established standards that list competencies and experiences that should be a part of the foundations required of all teachers.

The Foundations Standards are a part of the standards for teacher preparation in two areas of specialized preparation: 1) Computer/ Technology Literacy and 2) Educational Computing and Technology Leadership which have been approved by the National Council for Accreditation of Teacher Education (NCATE), the accreditation body for teacher preparation programs in the USA.

The curricula of all teacher education programs should prepare candidates to keep abreast of on-going changes in educational computing and technology and the implications of these changes for education. In addition, the curricula should prepare teacher candidates to utilize and integrate a broad base of educational computing and technology applications found in home, industry, business, and school environments to enhance student learning and their own personal productivity.

An international survey, conducted by the ISTE Accreditation Committee, polled professionals in education and instructional technology concerning the level of competence needed by all

professional educators to be effective users of information technology both inside and outside the classroom environment. Professional educators throughout the United States and some outside the USA were then involved in developing, evaluating, and revising the Foundation Standards.

ISTE Foundations Standards

The Foundation Standards reflect professional studies in education that provide fundamental concepts and skills for applying information technology in educational settings. All candidates seeking initial certification or endorsements in teacher preparation programs should receive foundations that prepare them to:

1. demonstrate ability to operate a computer system in order to successfully utilize software.
2. evaluate and use computers and related technologies to support the instructional process.
3. apply current instructional principles, research, and appropriate assessment practices to the use of computers and related technologies.
4. explore, evaluate, and use computer/technology-based materials, including applications, educational software and associated documentation.
5. demonstrate knowledge of uses of computers for problem solving, data collection, information management, communications, presentations, and decision making.
6. design and develop student learning activities that integrate computing and technology for a variety of student grouping strategies and for diverse student populations.
7. evaluate, select and integrate computer/ technology-based instruction in the curriculum of one's subject area(s) and/or grade levels.
8. demonstrate knowledge of uses of multimedia, hypermedia, and telecommunications to support instruction.
9. demonstrate skill in using productivity tools for professional and personal use, including word processing, database, spreadsheet, and print/graphic utilities.
10. demonstrate knowledge of equity, ethical, legal and human issues of computing and technology use as they relate to society and model appropriate behaviors.

11. identify resources for staying current in applications of computing and related technologies in education.

12. use computer-based technologies to access information to enhance personal and professional productivity.

13. apply computers and related technologies to facilitate emerging roles of the learner and the educator.

Implications

If all teachers possessed the Foundations presented, they would be better prepared to work more effectively as professionals in their specific fields. They would be able to provide instruction that would better facilitate the students' learning, bring students and schools into the information age, enhance their own personal productivity, and, in the long range, improve communication between individuals and societies. The ultimate purpose of the Standards is to empower students by empowering teachers with the power of knowledge about those technology tools which are so rapidly changing our world.

COMPUTER/ TECHNOLOGY LITERACY ENDORSEMENT

The Computer/Technology Literacy endorsement guidelines include standards in three major areas: Foundations, Specialty Content in computer/ technology literacy, and Professional Teaching Preparation related to the use of computers and technology in instruction. Standards in Specialty Content include studies of or experiences with:

1) general concepts and skills, i.e., uses of computers in society, terminology, historical developments, social and ethical concerns, equity issues, professional development opportunities, student support activities, and the teaching of keyboarding skills;
2) programming and problem solving;
3) applications tools;
4) information access and delivery tools;
5) hardware/software selection, installation, and maintenance; and
6) professional teaching preparation including knowledge of and experiences with teaching methodologies relating specifically to instruction about computers and related technologies.

EDUCATIONAL COMPUTING AND TECHNOLOGY LEADERSHIP MASTER'S PROGRAM

In the Fall of 1991, ISTE approved accreditation standards and guidelines for master's programs in educational computing and technology leadership. Such programs are designed to prepare leaders in computer/technology education who will assist teachers in designing instruction that utilizes computers and other related technologies to meet the learning needs of students, provide appropriate staff development and inservice training to assist teachers in becoming effective users of educational technology, and assist school districts in preparing long range implementation plans for appropriately integrating educational computing in all curriculum areas and at all grade levels. A person completing such a program might serve as a district-level computer coordinator, computer specialist for a school, or director of computer-related training for a business.

Standards for the master's program in educational computing and technology leadership include competencies in the following specialty content:

1) research and learning theories;
2) programming environments;
3) computer authoring systems;
4) computing systems;
5) software selection, installation and maintenance; and
7) information access and delivery systems

Competencies relating to professional preparation includes standards for providing experiences with leadership and supervisory concepts and skills as they relate to technology-based systems in K-12 schools. Areas of emphasis include knowledge and skills related to:

1) facilities and resource management;
2) instructional program development;
3) teaching with and about technology; and
4) staff development.

Guidelines for such programs include standards which prepare candidates to become leaders in the selection, maintenance and management of computing hardware and software and the uses of computers and related technology throughout the curriculum.

V. FUTURE DIRECTIONS

SECONDARY COMPUTER SCIENCE EDUCATION PROGRAMS

ISTE is in the process of developing guidelines for programs that prepare candidates to teach formal secondary computer science courses. The proposed guidelines are currently undergoing review. The final recommendations from ISTE will be submitted to NCATE for consideration in the fall of 1992.

UNIT ACCREDITATION GUIDELINES

Unit Accreditation Guidelines specify standards to which each teacher preparation program must respond when applying for NCATE accreditation. ISTE has suggested changes in the unit standards and criteria which would raise expectations of technology use and technology-related experiences in teacher preparation. ISTE is currently pursuing the steps necessary to have the suggested changes considered by the NCATE Unit Accreditation Executive Board. The Accreditation Committee is hopeful that the suggested changes can be considered in the fall of 1992.

VI. FOLIO REVIEW PROCESS

FOLIO REVIEWER IDENTIFICATION

An invitation to apply for the position of Folio Reader is issued to members of ISTE in the ISTE Update newsletter and in the Journal of Computing in Teacher Education. Candidates submit a vita to the ISTE Accreditation Committee. A letter identifying the duties and responsibilities of the folio reader and requesting information about the candidate is sent to applicants. The vitae are evaluated by the committee and invitations to participate as folio reader are issued. Folio readers serve three-year terms, with selection staggered so that two-thirds of the folio reader team remain as experienced readers each year and no more than one third are new folio readers in any given year.

TRAINING AND REVIEW PROCEDURES

The folio review training and procedures are directed by the International Society for Technology in Education (ISTE) Accreditation Committee and coordinated through the ISTE National Office in Washington, D.C. Institutions submitting folios will submit the documents to the NCATE Office where four of the five copies will be forwarded to the ISTE National Office.

Folios are reviewed in group sessions of the folio readers and the ISTE Accreditation Committee for the first cycle of each year, and by mail the second cycle of each year. The group evaluation allows new folio readers to have the benefit of experienced readers in their first folio evaluation session, and provides a method for maintaining consistency among evaluations. At each group review session, the prior mailout folio evaluations are examined to check for problems of consistency.

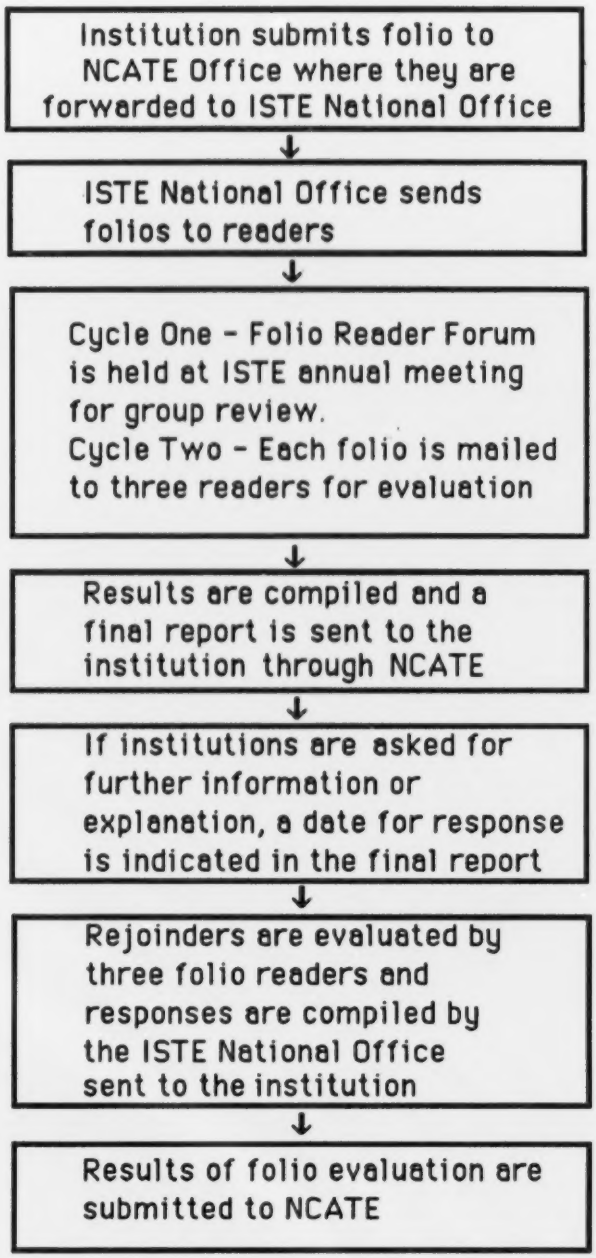
The group sessions are held at an annual ISTE conference, led by the Accreditation Committee and the ISTE National Office personnel. The ISTE National Office compiles results of the group deliberations into a final report which is examined by the Accreditation Committee and submitted to the institution through NCATE.

The mail-out procedure involves evaluation of each folio by three folio readers who submit to the ISTE National Office an evaluation check sheet with comments and recommendations. The results of evaluation by the three readers will be compiled at the National Office and a final report will be mailed to the ISTE Accreditation Committee Chair and to the institution through NCATE. Rejoinders are handled through a mail-out procedure including evaluation of the rejoinder by three readers, compilation and response by the National Office, and approval by the ISTE Accreditation Committee. To assist ISTE in maintaining quality evaluations, the ISTE National Office will provide the Accreditation Committee with a yearly report of the folios evaluated, the results from each reader, the combined results, the areas of program weaknesses, and any problems that have arisen in development or evaluation of the folios.

Workshops or sessions to assist representatives of institutions undergoing the NCATE accreditation process will be held at an ISTE annual conference and at other general education conferences as need exists. Sessions will be reported in the ISTE Update newsletter calendar.

Descriptions and discussions of the roles, responsibilities, and terms of service of accreditation-related positions are included in ISTE Policies and Procedures.

Folio Evaluation Procedure


Institution submits folio to NCATE Office where they are forwarded to ISTE National Office
ISTE National Office sends folios to readers
Cycle One - Folio Reader Forum is held at ISTE annual meeting for group review.
Cycle Two - Each folio is mailed to three readers for evaluation
Results are compiled and a final report is sent to the institution through NCATE
If institutions are asked for further information or explanation, a date for response is indicated in the final report
Rejoinders are evaluated by three folio readers and responses are compiled by the ISTE National Office sent to the institution
Results of folio evaluation are submitted to NCATE

NCATE CURRICULUM GUIDELINES

for

EDUCATIONAL COMPUTING AND TECHNOLOGY

Basic Computer / Technology Literacy Endorsement Program

and

Advanced Educational Computing and Technology Master's Program

Prepared by the

International Society for Technology in Education (ISTE)

These guidelines for basic and advanced programs in educational computing and technology were approved by NCATE September 1991. Institutions must respond to these guidelines if their on-site visits are scheduled for April, 1993 and afterwards. Institutions with visits scheduled prior to April, 1993 have the option of responding to these guidelines.

Institutions seeking NCATE accreditation are required to respond to the curriculum sections of ISTE's guidelines as adapted for this document. The folio preparation manual, Curriculum Guidelines for Accreditation of Educational Computing and Technology Programs (1991), can be purchased for $20.00 from ISTE, 1787 Agate Street, Eugene, OR 97403-1923.

Guidelines for
Educational Computing and Technology

Introduction

Educational computing and technology is an emerging field which encompasses many subdisciplines. This field includes knowledge about and use of computers and related technologies in (1) delivery, development, prescription, and assessment of instruction; (2) effective uses of computers as an aid to problem solving and critical thinking in every academic discipline; (3) school administration; (4) educational research; (5) electronic information access; (6) professional and personal productivity; and (7) computer science education.

The International Society for Technology in Education (ISTE) recognizes that computer education is an essential part of the preparation of all teachers. ISTE also recognizes standard specialty areas that go beyond the general education level and has established guidelines in educational computing and technology for programs that can exist at the basic and advanced levels within teacher education programs. These guidelines will assist teacher education units and professional organizations and agencies in understanding and evaluating the educational preparation needed for the levels of specialization within the field.

The curriculum in all programs will prepare candidates to keep abreast of changes in educational computing and technology and their impact in education. In addition, the curriculum will prepare candidates to utilize and integrate a broad base of educational computing and technology applications found in home, industry, business, and school environments to enhance student learning. Finally, the curriculum will prepare candidates to work effectively as professional leaders to advance their specific fields within a culturally diverse society.

Who should complete these guidelines?

This document includes guidelines for basic and advanced educational computing and technology programs including the: (1) computer / technology literacy endorsement; and the (2) educational computing and technology master's level program. The computer / technology literacy endorsement is commonly found in states where computer literacy is taught as a separate course. Institutions with programs that prepare teachers of those courses and / or prepare teachers to serve as a computer resource person within an elementary, middle, or secondary school should complete the computer/ technology literacy matrix. Computer resource persons may provide support related to instructional computing for their peers and / or they may facilitate instruction involving use of computers and related technologies for students in special settings outside the regular classroom. The educational computing and technology master's guidelines apply to programs designed to prepare candidates for those positions commonly referred to as computer or technology coordinators. Special preparation in computing systems, facilities planning and management, instructional program development, staff development, etc. prepares candidates to serve at a district, regional, or state level in use of computers and related technologies in education.

COVER SHEET
International Society for Technology in Education

SUBMITTED BY: _____

(Name of University)

_____

(Address)

_____

(Address)

DATE: _____ **FAX :** _____

CHIEF COMPILER: _____ **PHONE:** _____

Check levels offered:

Computer/Technology Literacy Endorsement Program _____

Educational Computing & Technology Master's Program _____

Checklist of materials to be enclosed with this folio:

____ Overview for each program, including the following:

- ____ (1) Objectives of the program.
- ____ (2) Students' course of studies, including name of program, level of preparation, and exact courses and recommended sequence. Indicate all required courses in the specialty area.
- ____ (3) Description of field experiences, student teaching, and internships, as appropriate per program. Include the amount of time and the type of supervision.
- ____ (4) Explanation of how a program may deviate from the guidelines.
- ____ (5) Description of where the program is located within the professional education unit and its interrelationships with other programs in the unit and the university/ college.
- ____ (6) List of faculty with primary assignments in the computer education programs. USE FACULTY SURVEY FORM PROVIDED. (Do not send vitae).
- ____ (7) a. Number of students currently enrolled in the program.
  b. Number of graduates from each program over the past three years.
- ____ (8) Course information. For each SPECIALTY course in the program please submit a separate document which includes the following: a) course name and number; b) catalog description; c) course syllabus, including list of topics, bibliography, and text(s) used (An existing syllabus may be attached if it covers the items listed.); d) course history for the past two years which includes the number of sections of this course that were taught, when and by whom the course/sections were taught. When listing staff, please indicate their rank and whether full or part time. Include a brief description of and indicate the amount of time spent in lab experiences for this course.
- ____ (9) Attach a copy of any written policies or procedures that guide or govern each program (e.g., State Guidelines, etc.).

_____ Matrix / Matrices
_____ College Catalog

Faculty Survey Form for:

	Name [include full/part, adjuncts, TA's, other]	Highest degree attained	Tenure Track? [Y / N]	Rank	Full Time at Univ? [Y / N]	% Time in specialty courses
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						

17

INSTRUCTIONS FOR PREPARING THE FOLIO

The NCATE folio(s) for Computer / Technology Literacy and Educational Computing and Technology must include the items listed on the cover sheet. Use the Faculty Survey Form to report information regarding faculty teaching courses in the specialty area only.

Use the attached matrix to provide a summary of your program(s). The information provided in the matrix should describe and substantiate the degree to which your program meets each guideline. You may choose to develop a matrix on the computer so that sufficient space to respond is available. Relate the course numbers to the accompanying syllabi, by entering the course number and the location in the syllabus or other accompanying documents where compliance is demonstrated. If activities are included in your program, but are not reported in the syllabus or other documents, a short summary of the experience provided to students that demonstrates compliance may be typed directly into the matrix.

Example:

Computer / Technology Literacy Endorsement - Guidelines	**Courses and/or experiences that fulfill the guidelines**
2.4.1 functional knowledge of telecommunications tools and resources.	**Educ. 448, III.A. Resources: Students are required to develop a resource list in each major area of study. The telecommunications list includes current opportunities for telecommunications that are available for schools and the contact address or phone.**

In the example above, the syllabus for Educ. 448 clearly documented activities that illustrated functional knowledge of telecommunications **tools** in section III. A., so only the reference to course number and section of the course outline was needed to direct the folio reader to evidence of compliance. However, the activity illustrating compliance with the functional knowledge of telecommunications **resources** was not included in the outline. Therefore, the folio writer included the experience in the matrix in the form of a brief description.

In the left margin of the course syllabus, the folio writer should reference each section of the outline to the standard or competency that it addresses. For example, Section III. A. in the syllabus (referred to in the above example) would have **2.4.1** in the left margin to indicate which standard this section meets in the matrix.

Five copies of the folio must be sent to NCATE with the institution's precondition package. If there are any questions about these guidelines or the submission of this folio, please contact either the ISTE National Office, 20101 Academic Way, Room 227E, Ashburn, VA 22011, phone (703) 729-8252, Lajeane Thomas at (318) 257-3923, or the NCATE office.

GLOSSARY OF TERMINOLOGY USED IN THE GUIDELINES

Four levels of knowledge are referenced in the guidelines, each at an increasing level of depth:

awareness - individual has limited exposure to the skill or concept, but is aware of its existence and that the issue, concept, skill, etc., is of concern in the realm of computer using educators. (Example: Students read chapter, listen to lecture, or see video on adaptive hardware.)

knowledge - individual is not only aware of the concept, but has completed activities that require study of the issue, concept, or skill beyond the awareness level. (Example: Students compile reports on adaptive devices; their uses; advantages and disadvantages of available models; special configurations needed to support the devices; and sources of further information about the devices.)

functional knowledge - individual has not only studied the issue, concept, or skill, but also has applied the principle or skill in activities requiring a working knowledge, or operational expertise with the principle or skill. (Example: Individual visits a lab where adaptive hardware is installed, uses the devices, observes students with handicaps using the assistive devices, and develops a lab-based activity which requires use of the adaptive devices.)

advanced knowledge - individual has developed a skill or knowledge level that includes ability to analyze, synthesize, and evaluate information and enables them to teach the skill or principles to others, including peers (Example: Individual assists in use of adaptive hardware in a classroom with handicapped students, and / or leads discussion and demonstration of the adaptive hardware among other teachers or teacher candidates identifying criteria for selection of appropriate devices to be used with specific handicapping conditions.)

Additional examples and terminology as well as other information regarding accreditation are included in the document entitled, Curriculum Guidelines for Accreditation of Eductional Computing and Technology Programs (1992), available from ISTE, 1787 Agate Street, Eugene, OR 97403-1923. Phone (503) 346-4414.

International Society for Technology in Education
Proposed Curriculum Guidelines for
Teacher Preparation Programs in
COMPUTER / TECHNOLOGY LITERACY

The computer / technology literacy matrix specifies guidelines for endorsement programs preparing teachers of computer / technology literacy. Computer / technology literacy includes (a) issues of technology use in society; (b) fundamental vocabulary and operations of computer / technology-based systems; (c) use of tool applications for personal, academic and instructional productivity; and (d) use of the computer as a tool for problem solving.

The guidelines in computer / technology literacy include instruction in these major areas:

(1) foundations for use of computers and technology in educational settings;
(2) specialty content in computer literacy; and
(3) professional teaching preparation relating to use of computers and technology in instruction.

COMPUTER / TECHNOLOGY LITERACY
Endorsement Program

Computer / Technology Literacy Endorsement Guidelines	**Courses and/or experiences that fulfill the guidelines**
1.0 Prerequisite Preparation: Professional studies culminating in the computer / technology literacy endorsement must include experiences that provide a foundation for use of computers and related technologies in educational settings.	
1.1 **Foundations:** Professional studies in educational computing and technology provide fundamental concepts and skills that build a foundation for applying computers and related hardware and software in educational settings. All candidates seeking initial endorsements in teacher preparation programs and particularly programs in educational computing and technology require foundations that prepare them to:	
1.1.1 demonstrate the ability to operate a computer system in order to successfully utilize software.	
1.1.2 evaluate and use computers and related technologies to support the instructional process.	
1.1.3 apply current instructional principles, research, and appropriate assessment practices to the use of computers and related technologies.	
1.1.4 explore, evaluate, and use computer / technology-based materials, including applications, educational software, and associated documentation.	

1.1.5 demonstrate knowledge of uses of computers for problem solving, data collection, information management, communications, presentations, and decision making.	
1.1.6 design and develop student learning activities that integrate computing and technology for a variety of student grouping strategies and for diverse student populations.	
1.1.7 evaluate, select and integrate computer / technology-based instruction in the curriculum of one's subject area(s) and/or grade levels.	
1.1.8 demonstrate knowledge of multimedia, hypermedia, and telecommunications activities to support instruction.	
1.1.9 demonstrate skill in using productivity tools for professional and personal use, including word processing, database, spreadsheet, and print/graphic utilities.	
1.1.10 demonstrate knowledge of equity, ethical, legal and human issues of computing and technology use as they relate to society and model appropriate behaviors.	
1.1.11 identify resources for staying current in applications of computing and related technologies in education.	
1.1.12 use computer-based technologies to access information to enhance personal and professional productivity.	
1.1.13 apply computers and related technologies to facilitate emerging roles of the learner and the educator.	

2.0 Specialty Content Preparation Computer / Technology Literacy: Professional studies in educational computing and technology provide concepts and skills that prepare teachers in the specialized content needed to teach computer literacy. Candidates seeking basic endorsements in computer literacy require specialty content preparation in these areas: (2.1) general; (2.2) programming and problem solving; (2.3) applications tools; (2.4) information access and delivery tools; (2.5) hardware/software selection, installation and maintenance.	
2.1 General: General content preparation in computer literacy extends foundations concepts and skills to provide in-depth knowledge needed to teach about computers and related technologies and their impact and general operation. The program includes studies and experiences which prepare candidates to:	
2.1.1 demonstrate knowledge of uses of computers and technology in business, industry, and society.	
2.1.2 demonstrate functional knowledge of terminology associated with educational computing and technology.	
2.1.3 demonstrate knowledge about the historical development and future directions of computing and technology.	
2.1.4 demonstrate knowledge of the ethical, legal, and human issues associated with use of computers, related technologies, and software and model appropriate behaviors.	
2.1.5 demonstrate knowledge of the equity issues associated with use of computers and related technologies and model appropriate behaviors.	
2.1.6 use sources of information about computers and technology for professional development (e.g., journals, associations, seminars, conferences, and on-line services).	
2.1.7 participate in student guidance, career awareness, and student support activities related to computer / technology.	
2.1.8 model, encourage, and reinforce appropriate keyboarding skills.	

2.2 Programming and Problem Solving: Professional studies in educational computing and technology provide concepts and skills in applying computers and other hardware and software to solve problems. It is recommended that the following skills and concepts be equivalent in depth to at least the level achieved in one three semester hour course. Programs require studies of and experiences with programming and problem solving skills and concepts that provide:	
2.2.1 functional knowledge of at least one programming language and the ability to compare languages commonly used in education (e.g., structured BASIC, Logo, and/or Pascal).	
2.2.2 functional knowledge of structured programming concepts and design of algorithms.	
2.2.3 functional knowledge of program verification and debugging techniques.	
2.2.4 knowledge of applications of programming skills to support and enhance the curriculum and the development of problem-solving skills.	
2.2.5 awareness of other programming, authoring, and problem solving environments.	
2.3 Applications Tools: Professional studies in educational computing and technology provide concepts and skills in using technology-based tools. Programs require studies of and experiences that provide:	
2.3.1 functional knowledge of word processing, desktop publishing, spreadsheets, database management, integrated packages, graphics programs and utilities, and teacher utility tools.	
2.3.2 knowledge of utilization of applications tools to support and enhance the curriculum and develop problem solving skills.	

2.4 Information Access and Delivery Tools: Professional studies in educational computing and technology provide concepts and skills in applying computers and other hardware and software as tools for presentation, research, information access, and communications. Programs require studies of and experiences with applications that provide:	
2.4.1 functional knowledge of telecommunications tools and resources.	
2.4.2 functional knowledge of the utilization of telecommunications for information sharing, remote information access and retrieval, broadcast resources, and distance learning.	
2.4.3 functional knowledge of multimedia and hypermedia tools and resources.	
2.4.4 knowledge of application of information access and delivery tools to support and enhance the curriculum and develop problem solving skills.	
2.5 Hardware/Software Selection, Installation, and Maintenance: Professional studies in educational computing and technology provide concepts and skills in hardware and software selection, installation, and routine maintenance. Programs require:	
2.5.1 knowledge of configuration of computer / technology systems and related peripherals into laboratory, classroom cluster, and other appropriate instructional arrangements.	
2.5.2 knowledge to support development of laboratory policies, procedures, and practices.	
2.5.3 functional knowledge of evaluation, selection, and development of recommendations for purchasing software to support and enhance the curriculum.	

2.5.4 knowledge of procedures for evaluation, selection, and development of recommendations for purchasing computer / technology systems.	
2.5.5 knowledge of procedures for the organization, management, and security of hardware and software.	
2.5.6 functional knowledge of basic troubleshooting and maintenance of hardware and software.	
2.5.7 knowledge of networked systems.	
3.0 Professional Preparation: Professional preparation of computer / technology literacy teachers includes experiences that combine teaching skills and concepts with knowledge about and use of computers and related technologies.	
3.1 Teaching Methodology: Professional studies in educational computing and technology provide knowledge and practice of teaching methodology that applies specifically to the problems and procedures encountered when working with technology. Programs require studies of and experiences with computers, related technologies, and software throughout the curriculum and methodology relating specifically to instruction about the computer which provide:	
3.1.1 functional knowledge of methods and strategies for teaching general concepts and skills related to computers / technology.	
3.1.2 functional knowledge of methods and strategies for teaching programming and problem solving principles and skills.	
3.1.3 functional knowledge of methods and strategies for teaching applications tools.	
3.1.4 functional knowledge of methods and strategies for teaching the use of information access and delivery tools.	
3.1.5 observations and / or teaching experiences in lab and classroom settings involving computers and related technologies.	

3.1.6 awareness of computer / technology literacy curriculum and the ongoing need to update the curriculum to reflect changes in technology.	
3.1.7 experiences in planning computer / technology literacy teaching activities that reflect the changes in the teacher / learner roles.	

International Society for Technology in Education
Proposed Curriculum Guidelines for
Master's Program in
EDUCATIONAL COMPUTING AND TECHNOLOGY

At the advanced level, ISTE identifies one program, a master's program, in educational computing and technology. This matrix specifies guidelines for programs preparing educators to assume positions of leadership and support for computing and technology use in schools, districts, and other educational agencies.

Those prepared in educational computing and technology programs help guarantee a rich flow of computer and related technology resources to the instructional program. They are instructional consultants who can: (a) assist teachers in designing instruction that utilizes computers and other related technologies to meet the learning needs of students; (b) provide appropriate staff development and inservice to assist teachers in becoming effective users of educational technology; (c) assist school districts in preparing long range implementation plans for integrating educational computing across all curriculum areas and at all grade levels. The educational computing and technology program builds upon a broad educational background and includes professional studies in teacher education.

Educational Computing and Technology - Master's Program

Professional studies in educational computing and technology at the master's level are designed to prepare computer / technology leaders for schools, school districts or non-traditional educational/ training situations. A person completing such a program might serve as a district-level computer coordinator, computer specialist for a school, or director of computer-related training for a business.

Educational Computing and Technology Master's Guidelines	Courses and/or experiences that fulfill the guidelines
1.0 Prerequisite Preparation: As a prerequisite to the master's program, candidates must document knowledge and competencies contained in the Computer / Technology Literacy matrix.	
1.1 Foundations: Professional studies in educational computing and technology provide fundamental concepts and skills that build a foundation for applying computers and other hardware and software in educational settings. All candidates seeking initial endorsement in teacher preparation programs and particularly programs in educational computing and technology require foundations. Master's programs must document the prerequisite preparation of the master's candidates or provide instruction to fulfill the foundations guidelines in initial coursework. (See Foundations section of Computer / Technology Literacy Matrix.)	
1.2 Speciality Content Preparation Computer / Technology Literacy: Professional studies in educational computing and technology provide concepts and skills that prepare teachers in the specialized and professional content for teaching computer / technology literacy. Master's programs must document the prerequisite preparation of the master's candidates or provide instruction to fulfill the computer / technology literacy guidelines in initial coursework (submit guidelines and matrix for computer / technology literacy).	
2.0 Specialty Content Preparation: Professional studies in educational computing and technology (master's program) provide concepts and skills which prepare candidates to be leaders in the selection, maintenance, and management of computing hardware and software and the uses of computers and related technology throughout the curriculum. Such a program will provide preparation in the following areas:	

2.1 Research and Theories: Professional studies in a master's program in educational computing and technology give students a foundation in educational research, the psychology of learning, instructional design, as well as research findings involving the use of computers and related technologies in education. The master's program will include experiences designed to provide:	
2.1.1 knowledge of practices and theories of research related to educational computing / technology.	
2.1.2 knowledge of major research findings and trends related to the use of computers and related technology in education.	
2.1.3 knowledge of theories of learning, teaching, and instructional design and specific knowledge of these as they relate to computer-based and computer-managed instruction.	
2.1.4 knowledge of theories and research findings about related technologies (e.g., CD ROM, video disk, video & audio devices).	
2.1.5 knowledge of the social and historical foundations of education in general and how they relate to computers and related technology.	
2.1.6 knowledge of research and theories related to equity issues concerning the use of computers and related technologies in education.	
2.2 Programming languages: Professional studies leading to a master's program in educational computing and technology provide mastery of structured programming concepts and techniques. The master's program will include experiences designed to provide:	
2.2.1 advanced knowledge of at least one computer programming environment commonly used in education and experiences with additional languages.	

2.2.2 awareness of other types of programming environments, languages and evolving methodologies (e.g., object oriented programming, logic languages, machine languages, 4th generation languages, hyper-media).	
2.3 Computer authoring tools: Professional studies for a master's program in educational computing and technology provide mastery of at least one authoring tool. The master's program will include experiences designed to provide:	
2.3.1 advanced knowledge of at least one modern computer authoring tool (e.g., hypermedia development tools) including the ability to create substantive computer-based lessons in that system.	
2.3.2 ability to use the authoring tool to create multimedia applications.	
2.4 Computing systems: Professional studies leading to a master's degree in educational computing and technology provide knowledge of computing systems used in school settings. The master's program will include experiences designed to provide:	
2.4.1 functional knowledge of the major kinds of computing systems used in K-12 schools.	
2.4.2 ability to manipulate a variety of operating systems effectively in K-12 settings.	
2.4.3 ability to evaluate hardware systems and configurations for classrooms and laboratories.	
2.4.4 advanced knowledge of policies and procedures for managing computer / technology laboratories (e.g., staffing, scheduling, and security).	
2.4.5 functional knowledge of networking systems appropriate for K-12 schools including experience with at least one system.	

2.4.5 awareness of adaptive hardware and software for students and teachers with special needs.	
2.5 Software selection, installation, and maintenance: Professional studies for a master's program in educational computing and technology provide knowledge of techniques for software selection, installation, and maintenance. The master's program will include experiences designed to provide:	
2.5.1 knowledge of software across the curriculum including general applications tools, teacher utility tools, and computer-based instruction.	
2.5.2 knowledge of sources of software and purchasing strategies and procedures related to K-12 schools.	
2.5.3 knowledge of appropriate software evaluation techniques and sources of software evaluations.	
2.5.4 functional knowledge of methods of installation, maintenance, management of software libraries.	
2.5.5 knowledge of ethical, legal, and practical considerations for maintaining software libraries.	
2.6 Information access and delivery systems: Professional studies for a master's in educational computing and technology provide knowledge of information access and delivery systems including telecommunications and multimedia hardware, software, and resources. The master's program will include experiences designed to provide:	
2.6.1 tools and resources and their uses across the curriculum.	
2.6.2 advanced knowledge of multimedia tools and resources and their uses across the curriculum.	
2.6.3 the ability to create and manipulate multimedia presentations for educational and training settings.	

3.0 Professional Preparation: Professional studies in educational computing and technology combine leadership skills and concepts with knowledge about and use of computers and related technologies. Master's programs preparing educators for a specialty area in educational computing and technology require studies of and experiences with leadership and supervisory concepts and skills as they relate to use of technology-based systems in K-12 education. Such programs will provide preparation in the following areas:	
3.1 Knowledge and skills related to facilities and resource management: Professional studies in the educational computing and technology (master's program) provide concepts and skills which prepare candidates to be leaders in facilities and resource management. Studies and experiences required in this program provide:	
3.1.1 knowledge of budget planning and management procedures related to educational computing and technology, including knowledge of funding sources and principles of grantsmanship.	
3.1.2 functional knowledge of strategies and procedures for resource acquisition and management of technology-based systems including hardware and software.	
3.1.3 functional knowledge related to basic trouble shooting, preventive maintenance and securing system wide maintenance services.	
3.1.4 knowledge of facilities planning issues related to computers / technology.	
3.2 Knowledge and skills related to instructional program development: Professional studies in the educational computing and technology (master's program) provide concepts and skills which prepare them to be leaders in instructional program development as it relates to the use of computers and other related technologies. Studies and experiences required in this program provide:	
3.2.1 functional knowledge of current principles of strategic planning and curriculum design for teaching with computers and related technologies.	
3.2.2 functional knowledge of current research findings and of national, state and local guidelines influencing computing and educational technology in the K-12 environment.	

3.2.3 functional knowledge of current principles of strategic planning and curriculum design for development of appropriate computer and technology-related skills for students.	
3.2.4 knowledge of strategies and techniques of leadership and support for facilitating and developing technology - rich programs.	
3.2.5 knowledge of leadership roles in creating change and facilitating technology-related innovation.	
3.3 Knowledge & skills related to teaching with and about technology: Professional studies in the educational computing and technology specialty (master's program) provide concepts and skills which prepare candidates to teach with and about computers and related technologies. The master's program includes experiences designed to provide:	
3.3.1 knowledge of methods and curriculum for teaching computer programming in a problem solving context in K-12 schools.	
3.3.2 knowledge of methods for teaching at least one modern authoring tool to colleagues and students.	
3.3.3 knowledge of curriculum, methods and research findings about media-based tools such as television, audio, print media, and graphics that may be used in conjunction with computer-based instruction.	
3.4 Knowledge and skills related to staff development: Professional studies in educational computing and technology (master's program) provide concepts and skills which prepare candidates to be leaders in staff development. Studies and experiences required in this program provide:	
3.4.1 functional knowledge of currently accepted principles of design and implementation of staff development programs.	

3.4.2 knowledge of sources of staff development opportunities for school officials, administrators, instructors, and support personnel.	
3.4.3 knowledge of the importance of effective staff development at all levels (e.g. teacher supervisor / evaluator, support personnel).	

SPECIAL INSTRUCTIONS FOR PREPARING FOLIOS

PREREQUISITE SKILLS

When completing a folio for either of the two programs, it is necessary to establish, as stated in 1.0 Prerequisite Preparation, that the prerequisite skills have been met or that they will be met through the course of study for the program. Documentation can be supplied that indicates that the Foundations (prerequisite to both programs) and Computer/Technology Literacy (prerequisite to Master's Program) have been met through several means. If those skills are a part of the undergraduate preparation of all teachers, then documentation might include course syllabi and/or a summary of the experiences provided to teachers throughout their course of study that meet the guidelines. For students who enter a program with undergraduate preparation from another university, a pretest over prerequisite skills may be administered or an evaluation of their prior experiences. If prerequisite skills are not ensured through some documented means, then those skills must be included in the curriculum of your program. This means that the folio for a master's program must include the evidence of prerequisite preparation by responding the competencies of the Computer/ Technology Matrix by completing the matrix or by other documentation as suggested above.

CONTACTS

The following matrices are annotated to provide explanations or examples to assist in the interpretation of the guidelines. A glossary of terms is also included in this document to clarify terms and expectations.

Note that the ISTE National Office manages the folio review process. The address is:

ISTE National Office
20101 Academic Way, Room 227E
Ashburn, VA 22011
(703) 729-8252

Questions may be directed to Lajeane Thomas, Accreditation Chair, Louisiana Tech University, P.O. Box 3161, Ruston, LA 71272
(318) 257-3923.

International Society for Technology in Education
Proposed Curriculum Guidelines for
Teacher Preparation Programs in
COMPUTER / TECHNOLOGY LITERACY

The computer / technology literacy matrix specifies guidelines for endorsement programs preparing teachers of computer / technology literacy. Computer / technology literacy includes (a) issues of technology use in society; (b) fundamental vocabulary and operations of computer / technology-based systems; (c) use of tool applications for personal, academic and instructional productivity; and (d) use of the computer as a tool for problem solving.

The guidelines in computer / technology literacy include instruction in these major areas:

(1) foundations for use of computers and technology in educational settings;
(2) specialty content in computer literacy; and
(3) professional teaching preparation relating to use of computers and technology in instruction.

COMPUTER / TECHNOLOGY LITERACY
Endorsement Program

Computer / Technology Literacy Endorsement Guidelines	**Courses and/or experiences that fulfill the guidelines**
1.0 Prerequisite Preparation: Professional studies culminating in the computer / technology literacy endorsement must include experiences that provide a foundation for use of computers and related technologies in educational settings.	
1.1 Foundations: Professional studies in educational computing and technology provide fundamental concepts and skills that build a foundation for applying computers and related hardware and software in educational settings. All candidates seeking initial endorsements in teacher preparation programs and particularly programs in educational computing and technology require foundations that prepare them to:	
1.1.1 demonstrate the ability to operate a computer system in order to successfully utilize software.	
1.1.2 evaluate and use computers and related technologies to support the instructional process.	'evaluate and use' may refer to activities where students determine the usefulness of hardware and software for instructional settings. An activity may include review of software or hardware where they use the software and write a review of its potential usefulness in instruction.
1.1.3 apply current instructional principles, research, and appropriate assessment practices to the use of computers and related technologies.	assessment practices include alternatives traditional grading practices that may include opportunities for project or product development, assessment of cooperative learning activities, portfolios of products representative of students' skills and knowledge, etc.
1.1.4 explore, evaluate, and use computer / technology-based materials, including applications, educational software, and associated documentation.	

1.1.5 demonstrate knowledge of uses of computers for problem solving, data collection, information management, communications, presentations, and decision making.	the intent of is that **each** in this list of uses of technology be addressed at least at the knowledge level.
1.1.6 design and develop student learning activities that integrate computing and technology for a variety of student grouping strategies and for diverse student populations.	an example activity might require that the student develop lesson plans for particular groupings, i.e., lab, classroom, small groups, pairs, or for students with differing characteristics.
1.1.7 evaluate, select and integrate computer / technology-based instruction in the curriculum of one's subject area(s) and/or grade levels.	extends guideline 1.1.2 to apply understandings developed when evaluating the software or hardware in planning instructional activities for a particular subject area and/or grade level. If this level was met in you explanation of 1.1.2, simply state "See 1.1.2".
1.1.8 demonstrate knowledge of multimedia, hypermedia, and telecommunications activities to support instruction.	knowledge of uses of these technologies to support instruction. See glossary for definitions and examples of each technology listed.
1.1.9 demonstrate skill in using productivity tools for professional and personal use, including word processing, database, spreadsheet, and print/graphic utilities.	the intent is that skills is demonstrated in using **each** of the productivity tools listed. See glossary for definitions.
1.1.10 demonstrate knowledge of equity, ethical, legal and human issues of computing and technology use as they relate to society and model appropriate behaviors.	See glossary for definitions or examples of terms.
1.1.11 identify resources for staying current in applications of computing and related technologies in education.	
1.1.12 use computer-based technologies to access information to enhance personal and professional productivity.	Examples of computer-based technologies for information access may include CD-ROM, on-line information sources, hypercard, video disc references, and others. Activities where students must use these types of to locate information.
1.1.13 apply computers and related technologies to facilitate emerging roles of the learner and the educator.	Example: Candidates have opportunities to participate in activities in which the teacher serves as facilitor, for instance, and the student learning is self-directed.

2.0 Specialty Content Preparation Computer / Technology Literacy: Professional studies in educational computing and technology provide concepts and skills that prepare teachers in the specialized content needed to teach computer literacy. Candidates seeking basic endorsements in computer literacy require specialty content preparation in these areas: (2.1) general; (2.2) programming and problem solving; (2.3) applications tools; (2.4) information access and delivery tools; (2.5) hardware/software selection, installation and maintenance.	
2.1 General: General content preparation in computer literacy extends foundations concepts and skills to provide in-depth knowledge needed to teach about computers and related technologies and their impact and general operation. The program includes studies and experiences which prepare candidates to:	
2.1.1 demonstrate knowledge of uses of computers and technology in business, industry, and society.	
2.1.2 demonstrate functional knowledge of terminology associated with educational computing and technology.	See instructions for definition of functional knowledge. Appropriate terminology is used in written and oral activities and students are able to state differences and likeness among terms.
2.1.3 demonstrate knowledge about the historical development and future directions of computing and technology.	
2.1.4 demonstrate knowledge of the ethical, legal, and human issues associated with use of computers, related technologies, and software and model appropriate behaviors.	Extends 1.1.10 to provide additional discussion and planning regarding these issues. If this level was met in your explanation of 1.1.10, simply state "See 1.1.10".
2.1.5 demonstrate knowledge of the equity issues associated with use of computers and related technologies and model appropriate behaviors.	Extends 1.1.10 to provide activities where students have opportunities to discuss and plan for equitable use of computers. If this level was met in your explanation of 1.1.10, simply state "See 1.1.10".
2.1.6 use sources of information about computers and technology for professional development (e.g., journals, associations, seminars, conferences, and on-line services).	
2.1.7 participate in student guidance, career awareness, and student support activities related to computer / technology.	Candidates participate in activities which develop awareness of educational and career opportunities in the field of computing and technology.
2.1.8 model, encourage, and reinforce appropriate keyboarding skills.	

2.2 Programming and Problem Solving: Professional studies in educational computing and technology provide concepts and skills in applying computers and other hardware and software to solve problems. It is recommended that the following skills and concepts be equivalent in depth to at least the level achieved in one three semester hour course. Programs require studies of and experiences with programming and problem solving skills and concepts that provide:	
2.2.1 functional knowledge of at least one programming language and the ability to compare languages commonly used in education (e.g., structured BASIC, Logo, and/or Pascal).	
2.2.2 functional knowledge of structured programming concepts and design of algorithms.	See glossary
2.2.3 functional knowledge of program verification and debugging techniques.	Activities designed to practice detection of mistakes and identification of strategies for locating logic and syntax errors
2.2.4 knowledge of applications of programming skills to support and enhance the curriculum and the development of problem-solving skills.	
2.2.5 awareness of other programming, authoring, and problem solving environments.	examples may include: hypertalk, etc.
2.3 Applications Tools: Professional studies in educational computing and technology provide concepts and skills in using technology-based tools. Programs require studies of and experiences that provide:	
2.3.1 functional knowledge of word processing, desktop publishing, spreadsheets, database management, integrated packages, graphics programs and utilities, and teacher utility tools.	Extends guideline 1.1.9 to include a wider range of tools and an increased level of expertise. If activities included in 1.1.9 adequately explore all of these tools and provide practice and application of those tools to the functional knowledge level, then indicate by stating, "See 1.1.9".
2.3.2 knowledge of utilization of applications tools to support and enhance the curriculum and develop problem solving skills.	

2.4 Information Access and Delivery Tools: Professional studies in educational computing and technology provide concepts and skills in applying computers and other hardware and software as tools for presentation, research, information access, and communications. Programs require studies of and experiences with applications that provide:	
2.4.1 functional knowledge of telecommunications tools and resources.	
2.4.2 functional knowledge of the utilization of telecommunications for information sharing, remote information access and retrieval, broadcast resources, and distance learning.	See glossary for definition of terms/examples.
2.4.3 functional knowledge of multimedia and hypermedia tools and resources.	
2.4.4 knowledge of application of information access and delivery tools to support and enhance the curriculum and develop problem solving skills.	Activities or experiences that familiarize students with information resources and assist them in utilizing those tools to access and use information.
2.5 Hardware/Software Selection, Installation, and Maintenance: Professional studies in educational computing and technology provide concepts and skills in hardware and software selection, installation, and routine maintenance. Programs require:	
2.5.1 knowledge of configuration of computer / technology systems and related peripherals into laboratory, classroom cluster, and other appropriate instructional arrangements.	See glossary for definition of terms.
2.5.2 knowledge to support development of laboratory policies, procedures, and practices.	
2.5.3 functional knowledge of evaluation, selection, and development of recommendations for purchasing software to support and enhance the curriculum.	

2.5.4 knowledge of procedures for evaluation, selection, and development of recommendations for purchasing computer / technology systems.	
2.5.5 knowledge of procedures for the organization, management, and security of hardware and software.	
2.5.6 functional knowledge of basic troubleshooting and maintenance of hardware and software.	See glossary for definition of terms.
2.5.7 knowledge of networked systems.	See glossary for definition of terms.
3.0 Professional Preparation: Professional preparation of computer / technology literacy teachers includes experiences that combine teaching skills and concepts with knowledge about and use of computers and related technologies.	
3.1 Teaching Methodology: Professional studies in educational computing and technology provide knowledge and practice of teaching methodology that applies specifically to the problems and procedures encountered when working with technology. Programs require studies of and experiences with computers, related technologies, and software throughout the curriculum and methodology relating specifically to instruction about the computer which provide:	
3.1.1 functional knowledge of methods and strategies for teaching general concepts and skills related to computers / technology.	
3.1.2 functional knowledge of methods and strategies for teaching programming and problem solving principles and skills.	
3.1.3 functional knowledge of methods and strategies for teaching applications tools.	
3.1.4 functional knowledge of methods and strategies for teaching the use of information access and delivery tools.	
3.1.5 observations and / or teaching experiences in lab and classroom settings involving computers and related technologies.	

3.1.6 awareness of computer / technology literacy curriculum and the ongoing need to update the curriculum to reflect changes in technology.	
3.1.7 experiences in planning computer / technology literacy teaching activities that reflect the changes in the teacher / learner roles.	Extends 1.1.3 to include opportunities to plan and direct activities in which the teacher serves as facilitator, for instance, and the student learning is self-directed.

International Society for Technology in Education
Proposed Curriculum Guidelines for
Master's Program in
EDUCATIONAL COMPUTING AND TECHNOLOGY

At the advanced level, ISTE identifies one program, a master's program, in educational computing and technology. This matrix specifies guidelines for programs preparing educators to assume positions of leadership and support for computing and technology use in schools, districts, and other educational agencies.

Those prepared in educational computing and technology programs help guarantee a rich flow of computer and related technology resources to the instructional program. They are instructional consultants who can: (a) assist teachers in designing instruction that utilizes computers and other related technologies to meet the learning needs of students; (b) provide appropriate staff development and inservice to assist teachers in becoming effective users of educational technology; (c) assist school districts in preparing long range implementation plans for integrating educational computing across all curriculum areas and at all grade levels. The educational computing and technology program builds upon a broad educational background and includes professional studies in teacher education.

Educational Computing and Technology - Master's Program

Professional studies in educational computing and technology at the master's level are designed to prepare computer / technology leaders for schools, school districts or non-traditional educational/ training situations. A person completing such a program might serve as a district-level computer coordinator, computer specialist for a school, or director of computer-related training for a business.

Educational Computing and Technology Master's Guidelines	Courses and/or experiences that fulfill the guidelines
1.0 Prerequisite Preparation: As a prerequisite to the master's program, candidates must document knowledge and competencies contained in the Computer / Technology Literacy matrix.	
1.1 Foundations: Professional studies in educational computing and technology provide fundamental concepts and skills that build a foundation for applying computers and other hardware and software in educational settings. All candidates seeking initial endorsement in teacher preparation programs and particularly programs in educational computing and technology require foundations. Master's programs must document the prerequisite preparation of the master's candidates or provide instruction to fulfill the foundations guidelines in initial coursework. (See Foundations section of Computer / Technology Literacy Matrix.)	
1.2 Speciality Content Preparation Computer / Technology Literacy: Professional studies in educational computing and technology provide concepts and skills that prepare teachers in the specialized and professional content for teaching computer / technology literacy. Master's programs must document the prerequisite preparation of the master's candidates or provide instruction to fulfill the computer / technology literacy guidelines in initial coursework (submit guidelines and matrix for computer / technology literacy).	
2.0 Specialty Content Preparation: Professional studies in educational computing and technology (master's program) provide concepts and skills which prepare candidates to be leaders in the selection, maintenance, and management of computing hardware and software and the uses of computers and related technology throughout the curriculum. Such a program will provide preparation in the following areas:	

2.1 Research and Theories: Professional studies in a master's program in educational computing and technology give students a foundation in educational research, the psychology of learning, instructional design, as well as research findings involving the use of computers and related technologies in education. The master's program will include experiences designed to provide:	
2.1.1 knowledge of practices and theories of research related to educational computing / technology.	
2.1.2 knowledge of major research findings and trends related to the use of computers and related technology in education.	
2.1.3 knowledge of theories of learning, teaching, and instructional design and specific knowledge of these as they relate to computer-based and computer-managed instruction.	
2.1.4 knowledge of theories and research findings about related technologies (e.g., CD ROM, video disk, video & audio devices).	
2.1.5 knowledge of the social and historical foundations of education in general and how they relate to computers and related technology.	
2.1.6 knowledge of research and theories related to equity issues concerning the use of computers and related technologies in education.	
2.2 Programming languages: Professional studies leading to a master's program in educational computing and technology provide mastery of structured programming concepts and techniques. The master's program will include experiences designed to provide:	
2.2.1 advanced knowledge of at least one computer programming environment commonly used in education and experiences with additional languages.	See glossary for definiton of programming environment. Tbis is not necessarily limited to structured programming languages.

2.2.2 awareness of other types of programming environments, languages and evolving methodologies (e.g., object oriented programming, logic languages, machine languages, 4th generation languages, hyper-media).	
2.3 Computer authoring tools: Professional studies for a master's program in educational computing and technology provide mastery of at least one authoring tool. The master's program will include experiences designed to provide:	
2.3.1 advanced knowledge of at least one modern computer authoring tool (e.g., hypermedia development tools) including the ability to create substantive computer-based lessons in that system.	See glossary for definition of terms.
2.3.2 ability to use the authoring tool to create multimedia applications.	
2.4 Computing systems: Professional studies leading to a master's degree in educational computing and technology provide knowledge of computing systems used in school settings. The master's program will include experiences designed to provide:	
2.4.1 functional knowledge of the major kinds of computing systems used in K-12 schools.	
2.4.2 ability to manipulate a variety of operating systems effectively in K-12 settings.	
2.4.3 ability to evaluate hardware systems and configurations for classrooms and laboratories.	
2.4.4 advanced knowledge of policies and procedures for managing computer / technology laboratories (e.g., staffing, scheduling, and security).	
2.4.5 functional knowledge of networking systems appropriate for K-12 schools including experience with at least one system.	The intent is that candidates are knowledgeable of a variety of available network systems and have used at least one.

2.4.5 awareness of adaptive hardware and software for students and teachers with special needs.	This level allows for observation of adaptive classrooms, viewing video tapes that show adaptive hardware being used, reading about the various devices, or a variety of other activities to familiarize the candidate with these types of assistive technologies.
2.5 Software selection, installation, and maintenance: Professional studies for a master's program in educational computing and technology provide knowledge of techniques for software selection, installation, and maintenance. The master's program will include experiences designed to provide:	
2.5.1 knowledge of software across the curriculum including general applications tools, teacher utility tools, and computer-based instruction.	
2.5.2 knowledge of sources of software and purchasing strategies and procedures related to K-12 schools.	
2.5.3 knowledge of appropriate software evaluation techniques and sources of software evaluations.	
2.5.4 functional knowledge of methods of installation, maintenance, management of software libraries.	Installation and maintenance refer to a level of familiarity with hardware and software that would allow candidates to install, backup, and update software that is purchased; provide basic maintenance for which a technician should not be needed; and manage the software collection.
2.5.5 knowledge of ethical, legal, and practical considerations for maintaining software libraries.	
2.6 Information access and delivery systems: Professional studies for a master's in educational computing and technology provide knowledge of information access and delivery systems including telecommunications and multimedia hardware, software, and resources. The master's program will include experiences designed to provide:	
2.6.1 tools and resources and their uses across the curriculum.	Activities that provide opportunities to become knowledgeable of tools and resources and their uses in a variety of subject areas and grade levels.
2.6.2 advanced knowledge of multimedia tools and resources and their uses across the curriculum.	
2.6.3 the ability to create and manipulate multimedia presentations for educational and training settings.	

3.0 Professional Preparation: Professional studies in educational computing and technology combine leadership skills and concepts with knowledge about and use of computers and related technologies. Master's programs preparing educators for a specialty area in educational computing and technology require studies of and experiences with leadership and supervisory concepts and skills as they relate to use of technology-based systems in K-12 education. Such programs will provide preparation in the following areas:	
3.1 Knowledge and skills related to facilities and resource management: Professional studies in the educational computing and technology (master's program) provide concepts and skills which prepare candidates to be leaders in facilities and resource management. Studies and experiences required in this program provide:	
3.1.1 knowledge of budget planning and management procedures related to educational computing and technology, including knowledge of funding sources and principles of grantsmanship.	
3.1.2 functional knowledge of strategies and procedures for resource acquisition and management of technology-based systems including hardware and software.	Examples: bid procedures, inventory, etc.
3.1.3 functional knowledge related to basic trouble shooting, preventive maintenance and securing system wide maintenance services.	
3.1.4 knowledge of facilities planning issues related to computers / technology.	
3.2 Knowledge and skills related to instructional program development: Professional studies in the educational computing and technology (master's program) provide concepts and skills which prepare them to be leaders in instructional program development as it relates to the use of computers and other related technologies. Studies and experiences required in this program provide:	
3.2.1 functional knowledge of current principles of strategic planning and curriculum design for teaching with computers and related technologies.	
3.2.2 functional knowledge of current research findings and of national, state and local guidelines influencing computing and educational technology in the K-12 environment.	

3.2.3 functional knowledge of current principles of strategic planning and curriculum design for development of appropriate computer and technology-related skills for students.	
3.2.4 knowledge of strategies and techniques of leadership and support for facilitating and developing technology - rich programs.	Examples: visioning, interacting with decision-makers, identification of appropriate contacts.
3.2.5 knowledge of leadership roles in creating change and facilitating technology-related innovation.	
3.3 Knowledge & skills related to teaching with and about technology: Professional studies in the educational computing and technology specialty (master's program) provide concepts and skills which prepare candidates to teach with and about computers and related technologies. The master's program includes experiences designed to provide:	
3.3.1 knowledge of methods and curriculum for teaching computer programming in a problem solving context in K-12 schools.	
3.3.2 knowledge of methods for teaching at least one modern authoring tool to colleagues and students.	
3.3.3 knowledge of curriculum, methods and research findings about media-based tools such as television, audio, print media, and graphics that may be used in conjunction with computer-based instruction.	
3.4 Knowledge and skills related to staff development: Professional studies in educational computing and technology (master's program) provide concepts and skills which prepare candidates to be leaders in staff development. Studies and experiences required in this program provide:	
3.4.1 functional knowledge of currently accepted principles of design and implementation of staff development programs.	

3.4.2 knowledge of sources of staff development opportunities for school officials, administrators, instructors, and support personnel.	
3.4.3 knowledge of the importance of effective staff development at all levels (e.g. teacher supervisor / evaluator, support personnel).	

GLOSSARY OF TERMS

adaptive hardware
Definition: Hardware (external and internal devices), utilized adapt the computer's capability for input, processing, and output for students of different needs.
Example: Touch Window Screen

advanced programs
Definition: An advanced program is a post-baccalaureate degree program for the advanced preparation of teachers and other professional school personnel. Graduate credit is commonly awarded. Master's, specialist and doctoral degrees are included as well as non-degree certification programs offered at the graduate level.

authoring tool
Definition: A tool that provides opportunities for an individual to develop or program an application to meet specific objectives.
Example: Hypercard, PILOT

basic programs
Definition: A basic program is a college or university program for the initial preparation of teachers. The courses commonly lead to a baccalaureate degree; exceptions may include the MAT or other extended programs designed to prepare teachers for initial certification.

basic trouble-shooting
Definition: An individual must be able to examine the primary components of the software and/or hardware to solve minor problems that would occur in daily usage of the specific application.

broadcast resources
Examples: CNN Newsroom, Channel One, Discovery Channel

classroom cluster
Definition: Small groups of students that can access various computer applications.

computer science education
Definition: Computer science education is a distinct discipline including such areas as (a) problem analysis; (b) algorithm selection and evaluation; (c) program design, implementation, specification, and verification; and (d) systems analysis.

computer/technology literacy
Definition: This area includes (a) issues of technology use in society; (b) fundamental vocabulary and operations of computer/technology based systems; and (c) use of tool applications for personal, academic and instructional productivity; and (d) use of the computer as a tool for problem solving.

distance learning
Definition: Use of telecommunications networks to transmit and deliver coursework to learners at remote sites.

dynamic information sharing
Examples: Kids Network, student maintained electronic conferencing, electronic mail

educational computing and technology
Definition: Educational computing and technology encompasses knowledge about and use of computers and related technologies in (1) delivery, development prescription and assessment of instruction; (2) knowledge of effective use of computers as aids to problem solving in ever academic discipline; (3) school administration; (4) educational research; (5) electronic

information access; (6) computer-related devices; and (7) use of computers in personal productivity.

endorsement programs
Definition: Endorsement programs result in certification for a specialized area of teaching added to the initial certification area. The endorsement program can be taken as a part of an existing undergraduate program and/or graduate program.

equity issues
Definition: Those issues that deal with equal distribution and use of computers and related technologies across subpopulations of students and educators.

ethical issues
Definition: Those issues that deal with the ethical use of software and computers and related technologies by students and educators.
Example: Privacy, piracy, integrity of information, responsibility of content and use of recreational applications.

human issues
Definition: Those issues that deal with societal and humanistic impact of computers and related technologies in today's global world.

hypermedia
Definition: Hypermedia refers to an interactive, nonlinear presentation of information in which more than one medium may be used (e.g., print, video, and computer), and in which users select their own paths through the material.

information access and delivery tools
Definition: Those tools that are used to access electronically archived information and computer or satellite-based telecommunications networks to enhance access and delivery of information.
Example: The combination of a modem and computer to access the Dialog Information Network.

legal issues
Definition: Those issues that deal with the legal use of software and computers and related technologies by students and educators.
Example: Violation of software copyright laws through illegal copying software or multiple loading single-machine copies of software.

master's program
Definition: The term, master's program is used to define the level of coursework as university-based work beyond initial teaching certification and beyond the undergraduate level.

multimedia
Definition: Multimedia refers to a combination of media, (e.g., audio, video, and print), under computer control.

non-traditional training situations
Example: Multimedia applications used to train individuals, satellite delivered staff development

on-line services
Definition: Use of computer-based telecommunications networks to access and retrieve information, to broadcast messages, to send electronic mail and/or to participate in user forums.
Example: CompuServe, Prodigy, NREN

print/graphic utilities
Definition: Those tools that can be used to make picture related documents such as banners,

signs, certificates, and cards.
Example: Print Shop, Super Print software

productivity tools
Definition: Productivity tools refer to any type of hardware and/or software associated with computers and related technologies that can be used as tools for personal, professional or classroom productivity.
Example: Software tool - Children's Writing and Publishing Center
Hardware tool - CamCorder

programming environment
Definition: An environment that supports the design, implementation, verification and application of a program using some type of programming or authoring language.
Example: Pascal, Logo, BASIC, Hypertalk

related technologies
Example: Related technologies refer to computers, videodisc players, CD-ROM players, imaging devices, interfaced musical equipment, robots, etc.

remote information access and retrieval
Definition: Use of telecommunications networks to access and retrieve information from a remote site.
Example: Use of Dialog Information Network to research a given topic such as the ERIC data base or stock market prices.

structured programming
Definition: Use of a top down or bottom up computer programming methodology to solve a given problem, resulting in a modular solution.

support personnel
Definition: Support personnel are those persons charged with facilitating the education activities of professionals in a school setting.

teacher utilities
Definition: Those software/hardware tools that can be used by the teacher to provide instructional/personal enhancements to existing applications.
Example: Gradebook program, test generator, class roster manager, etc.

technology-based instruction
Definition: Instructional applications that involve some aspect computers and/or related technologies.
Example: Use of a teacher constructed database in a social studies unit, graphing utility to teach relationships between two measures in economics, science or mathematics.

technology resource person
Definition: A person that is designated to provide knowledge, information and support for existing hardware, software, local and wide area networks, and preservice/inservce staff development wihthin an educational institution.
Example: School District Computer/Technology Coordinator

telecommunications
Definition: Telecommunications includes all types of electronic communication services including those delivered through satellite, fiber-optic, computer-based transmission,telephone, and radio.
Example: Global Electronic University, high school courses delivered by satellite, voice mail systems.

tools
Definition: Tools refer to any type of hardware and/or software associated with computer and related technologies that can be used as tools to complete a task or enhance productivity.

SELECTED TITLES OF CURRENT LITERATURE USED IN DEVELOPMENT OF GUIDELINES

COMPETENCIES FOR TECHNOLOGY LEADERSHIP

Bratlien, M. J. (1989). Computer development in educational administration. T.H.E. Journal , 16 (10), 46-49.

Byers, J. A. (1990). Certification standards for teachers of computer studies. Journal of Computing in Teacher Education, 6 (4), 9-14.

Kearsley, G. (1988). What should today's school administrators know about computers?. T. H.E. Journal, 16 (4), 65-69.

Marche, M. M. (1987). Information technologies in education: The perceptions of school principals and senior administrators. Educational Technology, 27 (1), 28-31.

Mims, T. and J. Poirot. Computer competencies for school administrators. Administrators and micros, an almost painless rendezvous. from handout Florida Educational Technology Conference, Daytona Beach, FL, Feb. 1990. 110-113.

Moursund, D. (1985). The Computer Coordinator. Eugene, OR: International Council for Computers in Education.

Scholastic, Inc. (Sept.,1989). An administrator's guide to the business of education. Electronic Learning, Special Supplement, New York, N .Y.: Author.

Thomas, L. and D. Knezek. (1991). Providing Technology Leadership in Restructured Schools. Journal of Research in Computing Education , 24 (2). in press.

Willis, C. L. (1989). Schools helping community broadens mission. The School Administrator, 9 (46), 29-30.

RESEARCH REPORTS ON TECHNOLOGY IN EDUCATION

American Association of Colleges for Teacher Education Task Force on Technology. (Nov.-Dec., 1987). The challenge of electronic technologies for colleges of education, Journal of Teacher Education. 38 (6), 25-29.

Ewell, P. (1991). To capture the ineffable: New forms of assessment in higher education. In G. Grant (Ed.), Review of Research in Education, Washington, D.C.: American Educational Research Association. 75-125.

Goodspeed, J. (1989). Washington Report: The NEA publishes two powerful reports on educational technology. Electronic Learning, 9 (1), 21.

International Society for Technology in Education.(1991). Report: Vision: T.E.S.T. , Eugene, OR.

Kinnaman, D. (1989). Newsline: NEA Committee on educational technology releases report. Classroom Computer Learning, 10 (1), 12.

Moss, J. (1988). Utah: A Case Study. Phi Delta Kappan, 70 (1), 25.

National Education Association. (1989). NEA Special Committee Report: Educational Technology. Washington, D.C.: Author.

The National Foundation for the Improvement of Education. (1989). Images of potential. Washington, DC: Author.

National School Boards Association. (1988). Thinking about technology in schools: A 1988 snapshot. Alexandria, VA: Author.

Office of Technology Assessment. (1988). Power On! New tools for teaching and learning, Summary (GPO Stock No. 052-003-01125-5). Washington, DC: U.S. Government Printing Office.

Utah State Office of Education. (1988). A shift in focus. Salt Lake City, UT: Strategic Planning Commission.

ROLE OF TECHNOLOGY IN SCHOOLS

Adkins, G. (1989). Megatrends author foresees the millennium. Educational Leadership, 47 (1), 16-17.

Benjamin, S. (1989). An ideascape for education: What futurists recommend. Educational Leadership, 47 (1), 8-14.

Cawelti, G. (1989). Designing high schools for the future. Educational Leadership, 47 (1), 30-35.

Carroll, J. M. (1990). The Copernican plan: Restructuring the American high school. Phi Delta Kappan, 71 (5), 358-365.

Dede, C. (1989). The evolution of information technology: Implications for curriculum. Educational Leadership, 47 (1), 23-26.

Dede, C. (1990). Educators, take hold of the future. Electronic Learning, 9 (4), 8-9.

D'Ignazio, F. (1988). Bringing the 1990s to the classroom of today. Phi Delta Kappan, 70 (1), 26-27.

Hay, L. E. and A. Roberts. (1989). Curriculum for the new millennium. Educational Leadership, 47 (1), 12.

Mecklenburger, J. A. (1988). What the ostrich sees: technology and the mission of American education. Phi Delta Kappan, 70 (1), 18-19.

Pearlman, R. (1989). Technology's role in restructuring schools. Electronic Learning, 8 (8), 8-15.

Perelman, L. J. (1988). Restructuring the system is the solution. Phi Delta Kappan, 70 (1), 20-24.

Shane, H. G. (1989). Educated foresight for the 1990s. Educational Leadership, 47 (1), 4-6.

Shanker, A. (1990). The end of the traditional model of schooling -- and a proposal for using incentives to restructure our public schools. Phi Delta Kappan, 71 (5), 344-357.

TECHNOLOGY AND INNOVATION IN EDUCATION

McGinty, T. (1987). Electronic Learning's second annual computer coordinator survey: Growing pains--A portrait of an emerging profession. Electronic Learning, 6 (5), 18-23, 48.

Strudler, N.B. (1987). The role of school-based computer coordinators as change agents in elementary school programs. Unpublished doctoral dissertation, University of Oregon, Eugene.

Strudler, N.B. (1991). Education faculty as change agents: Strategies for integrating computers into teacher education programs. Technology and Teacher Education Annual - 1991, 276.

TECHNOLOGY COMPETENCIES FOR TEACHERS

Fratianni, J. E., R.H. Decker and B. Korver-Baum. (1990). Technology: Are future teachers being prepared for the 21st century?. Journal of Computing in Teacher Education, 6 (4), 15-23.

Fulton, K. (1988). Preservice and inservice: What must be done in both. Electronic Learning, 8 (2), pp. 32-36.

Moore, M. L. (1984). Preparing computer-using educators. The Computing Teacher, 11 (2), 48-52.

Sunburst Communications. (1989). Teachers' roles: How are they changing? Solutions, 4 (1), 1.

Neiss, M. L. (1991). Preparing computer-using educators for the 90s. Unpublished report. from Science, Mathematics & Computer Science Education, College of Education, Oregon State University, Corvallis, OR 97331 (503) 737-4031

Rockman, S. (1989). Research on multimedia in schools: The time has come; The time is now. Apple Education News.

Rogers, J. B., D. G. Moursund and G. L. Engel. (1985-86). Preparing precollege teachers for the computer age. Computers in Education, 9-14.

Vockell, E. L. (1990). Instructional principles behind computer use. The Computing Teacher. 18 (1), 10-15.

Accreditation Team

ISTE Representative to NCATE Board - Lajeane Thomas, Louisiana Tech University, Ruston, Louisiana
ISTE Liaison to NCATE - C. Dianne Martin, The George Washington University, Washington, D.C.
ISTE National Office Research Associate - Ronnie Lowenstein, ISTE

The ISTE Accreditation Committee

Lajeane Thomas, Chair
Louisiana Tech University
Ruston, Louisiana

Don Knezek
Educational Service Center - Region 20
San Antonio, Texas

Harriet Taylor
Louisiana State University
Baton Rouge, Louisiana

Joyce Friske
Jenks Public Schools
Jenks, Oklahoma

Sally Sloan
Winona State University
Winona, Minnesota

James Wiebe
California State University
Los Angeles, California

Board of Examiners

Joyce Friske
Jenks Public Schools
Jenks, Oklahoma
(term 1990-1993)

James Wiebe
California State University, Los Angeles
(term 1990-1993)

Gertrude Abramson
William Patterson College of New Jersey
(term 1991-1994)

Greg Brownell
Bowling Green University
Bowling Green, Indiana
(term 1992-1995)

Nancy Hunt
California State University, Fresno
(term 1992-1995)

Folio Readers

G. Ernest Anderson
University of Massachusetts
Professor of Education

Marcia B. Cushall
Frostburg State University
Maryland

Mark G. Gillingham
Washington State University
Assistant Professor of Education

Max McCulloch
Central Missouri State University
Professor of Secondary Education

Ivy J. Montoya
Miami High School
Miami, Florida

Vaughan Murphy
Heartland Area Education Agency
Johnston, Iowa

Patricia M. Parker
Regional Computer Resource Center
Montandon, Pennsylvania

Sharon Smaldino
University of Northern Iowa
Associate Professor

Keith Wetzel
Arizona State University - West
Assistant Professor